

CLAIMS

What is claimed is:

1. A computerized method of generating and rendering over a digital communications network a photorealistic three-dimensional (3D) perspective view of a 3D object selectively positioned and angularly positioned within a 3D scene, the method comprising:

selecting at a first computer an object with which there is associated a derived or companion low-resolution 3D object model, and a scene with which there is associated a derived or companion low-resolution 3D scene model;

rendering at the first computer from the derived or companion low-resolution 3D object model, and from the small derived or companion low-resolution 3D scene model, a first, rudimentary, low-resolution 3D image of the 3D object in the 3D scene for purpose of previewing;

manually interfacing with the computer and with software processes operating within the computer to size, positionally place and orient the selected 3D object in the low-resolution 3D image, and in the 3D scene, therein developing chosen scale and location and orientation parameters for the selected 3D object in the 3D scene;

communicating from the first computer upon a digital communications network to a second computer identity of the selected object, identity of the scene, and developed scale, location and orientation parameters, all as image information;

from the received image information in the second and any associated computer, selecting a high-resolution 3D model of the selected object, and selecting or developing a high-resolution 3D model of the scene;

rendering in the second computer and any associated computer a second, photorealistic, high-resolution 3D composite image of the 3D object scaled, located and oriented in the 3D scene in accordance with the developed scale, location and orientation parameters;

communicating from the second computer any associated computer upon the digital communications network back to the first computer the rendered second, photorealistic, high-resolution 3D composite image; and

5 displaying at the first computer the rendered second, photorealistic, high-resolution 3D composite image.

2. The computerized method of generating and rendering a photorealistic 3D perspective view according to claim 1

10 wherein the manually interfacing is further for illuminating the object in the scene so as to develop lighting parameters;

wherein the communicating is also of the lighting parameters; and

15 wherein the rendering of the second, photorealistic, high-resolution 3D composite image of the 3D object located and oriented in the 3D scene is further in consideration of the developed lighting parameters.

3. The computerized method of generating and rendering a photorealistic 3D perspective view according to claim 1

20 wherein the manually interfacing is further for specifying resolution parameters of the object in the scene;

wherein the communicating is also of the resolution parameters; and

25 wherein the rendering of the second, photorealistic, high-resolution 3D composite image of the object located and oriented in the scene is further in consideration of the specified resolution parameters.

30 4. A computerized method of generating and rendering over a digital communications network a photorealistic 3D perspective image of

a three-dimensional (3D) object that can exist in the real world located within, surrounding, or in front of,

35 a 3D scene that can also exist in the real world,

the method of presenting a 3D perspective image of a 3D object in a 3D scene comprising:

rendering at a first computer, communicative upon a digital communications network, a first, relatively low resolution, 3D perspective image of a 3D object in a 3D scene from

(1) a relatively low resolution 3D model of the suitably-real-world object,

(2) a relatively low resolution 3D model of a selected suitably-real-world scene,

in consideration of

(3) a selected 3D coordinate position and angular orientation of the 3D object in the 3D scene,

(4) location and orientation of a camera view onto the scene,

(5) scene and object size;

(6) parameter of the scene lighting, and

(7) parameters of resolution of any one or both of the object and of the scene;

wherein this first, rudimentary, low-resolution, 3D image simply shows the 3D object located and oriented in the 3D scene;

communicating from the first computer upon the digital communications network the information (1)-(7) to a second computer;

from information (1), selecting in the second computer (1a) a high-resolution 3D model of the selected suitably-real-world object, and from information (2), selecting or generating in the second computer (2a) a high-resolution 3D model of the selected suitably-real-world scene;

rendering at the second computer a second, high-resolution, 3D composite image from (1) the high-resolution 3D model of the selected object, or derivatives or extensions of this model, and (2a) the high-resolution 3D model of the scene, or derivatives or extensions of this model, in consideration of at least the information (3)-(7);

wherein the second, high-resolution, 3D composite image is a

photorealistic image of the 3D object in the 3D scene;

communicating from the second computer upon the digital communications network to the first computer the second, photorealistic, high-resolution 3D composite image; and
5 displaying at the first computer this second, high-resolution, photorealistic 3D composite image.

5. The method according to claim 4

exercised to the purpose that a prospective purchaser of the
10 suitably-real-world 3D object may be rendered the second, photorealistic, 3D perspective view of a 3D object that is a virtual object;

wherein should the virtual object be made real in the world, then it would not merely suitably exist within the suitably-real-world 3D scene, but would suitably so exist as depicted in the
15 second, photorealistic, composite image.

6. The method according to claim 4

wherein the rendering at a first computer of the first, low-
20 resolution, 3D composite image is from (1) a low-resolution 3D model of a scene derived at the first computer.

7. The method according to claim 4

wherein the rendering at a first computer of the first, low-
25 resolution, 3D composite image is from (1) a low-resolution 3D model of the object received upon the communications network from the second computer as a model dynamically generated from specifications provided to the second computer by the first computer.

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8. The method according to claim 4

wherein the rendering at a first computer of the first, low-resolution, 3D composite image is from (1) a low-resolution 3D model of the object received upon the communications network from
35 a third computer as a model from a pre-existing catalog of low-

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resolution 3D object models.

9. The method according to claim 4

wherein the rendering at a first computer of the first, low-resolution, 3D composite image is from (2) a low-resolution 3D model of the scene received upon the communications network from the second computer as a model dynamically generated from specifications provided to the second computer by the first computer.

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10. The method according to claim 4

wherein the rendering at a first computer of the first, low-resolution, 3D composite image is from (2) a low-resolution 3D model of the scene received upon the communications network from a third computer as a model from a pre-existing catalog of low-resolution 3D object models.

11. The method according to claim 10

wherein the (1) low-resolution 3D model of a selected suitably-real-world object received upon the communications network from the second computer is of an object for sale.

12. A computerized method of generating and rendering over a digital communications network a 3D perspective view of a three-dimensional object that can exist in the real world located within a three-dimensional space that can also exist in the real world, the method of presenting a 3D perspective image of a 3D object in a 3D space comprising:

using at a client computer upon a digital communications network

(1) one or more accurately-scaled 3D models representing one or more associated suitably-real-world 3D objects, and

(2) an accurately-scaled model of a 3D scene in which 3D scene the suitably-real-world 3D objects can exist,

(3) associated scene camera and lighting parameters,
(4) associated placement and rotational information
regarding where and at what positional attitude the one or more 3D
objects are placed within the 3D scene;

5 transmitting from the first computer upon the digital
communications network the information (1)-(4);

receiving at another, second, computer upon the digital
communications network the information (1)-(4);
in the second computer

10 in accordance with at least the information (1)
selecting or generating (1a) a detailed, high-resolution, model of
the one or more 3D objects.

in accordance with at least the information (2)
selecting or generating (2a) a detailed, high-resolution, model of
15 the 3D scene, and

in accordance with the (1a) and (2a) models, and
information (3)-(4) and extensions thereof,
a high-resolution 3D perspective view of the one or more 3D
objects properly scaled, located and oriented within the 3D scene;
20 and then

transmitting from the second computer upon the digital
communications network this high-resolution 3D perspective view;
and

receiving at the first computer upon the digital
25 communications network this high-resolution 3D perspective view;
and

displaying at the first computer this high-resolution 3D
perspective view.

30 13. The method according to claim 12

exercised to the purpose that a prospective purchaser of one
or more of the one or more suitably-real-world objects may be
rendered the high-resolution 3D perspective view where at least
one of the one or more 3D objects is a virtual object not existing
35 in the world, and which might only suitably exist within the

suitably-real-world 3D scene;

wherein even though at least one 3D object shown in the high-resolution 3D perspective view is virtual and does not actually exist, the 3D object both (i) could exist, and (ii) could exist as so shown within the high-resolution 3D perspective view.

14. A computerized method of producing a high resolution photorealistic 3D image on and between at least two computers communicating over a digital communications network, the method comprising:

providing from a server computer across a digital communications network to a client computer (i) a catalog of small, low-resolution, 3D graphics models of objects and (ii) at least one model of a scene in which the objects may exist;

15 selecting at the client computer one or more objects and at least one scene;

communicating these selections from the client computer across the communications network to the server computer;

responsively to receipt of the selections, providing from the 20 server computer across the communications network to the client computer a set of at least the associated small, low-resolution 3D models;

manually manipulating at the client computer spatial (i) positions and orientations of a selected one or more object models 25 from the set of models (ii) within the at least one scene model, and rendering at the client computer from these object and scene models, a first, rudimentary, low-resolution 3D image of the one or more selected objects in the at least one scene, this low-resolution 3D image being used as a preview;

30 communicating, from the client computer across the communications network to the sever computer, at least camera, lighting and image size and resolution parameters, and positional placements and orientations of each of the selected and manipulated one or more objects in the at least one scene;

35 from the received positional placements and orientations of

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the selected one or more objects, rendering in the server computer from associated large high-resolution 3D models of the selected one or more objects and of the at least one scene, a photorealistic, 3D high-resolution composite image of the selected one or more objects located and oriented in the scene;

communicating from the sever computer upon the digital communications network to the client computer the photorealistically-rendered high-resolution 3D composite image; and

10 displaying at the client computer this photorealistically-rendered high-resolution 3D composite image.

15 15. The computerized method of producing a high resolution photorealistic image according to claim 14

15 wherein the photorealistically-rendered high-resolution 3D composite image is suitable to serve as advertising copy, meaning in particular that it is devoid of clearly visible defects;

wherein a 3D graphic artist of this photorealistically-rendered high-resolution 3D composite image who performs
20 selections and manipulations at the client computer need not have to attend to, and did not actually attend to, the building of the 3D models and any textures, which building transpired elsewhere.

16. The computerized method of producing a high resolution
25 photorealistic image according to claim 15

wherein the building of the 3D models and any textures transpired in a model-building computer.

17. The computerized method of producing a high resolution
30 photorealistic image according to claim 14

wherein the photorealistically-rendered high-resolution 3D composite image is suitable to serve as advertising copy, meaning in particular that it is devoid of clearly visible defects;

wherein a 3D graphic artist of this photorealistically-
35 rendered high-resolution 3D composite image who performs

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selections and manipulations at the client computer need not have to attend to, and did not actually attend to, the rendering, which transpired in the server computer.

518. A method of rendering at high resolution a photorealistic 3D image as a business service on a digital communications network, the high resolution photorealistic 3D image rendering business service comprising:

providing from a server computer across the digital
10communications network to a client computer

any of (i) a catalog of small, low-resolution, 3D graphics models, or (ii) a tool for generating small, low-resolution, 3D graphics models, or (iii) an actual, small, low-resolution, 3D graphics models

15 of at least (1) objects and (2) scenes in which the objects may exist;

receiving at the server computer upon the digital communications network from the client computer information as to the identities of at least one object and at least one scene
20selected from the catalog, and further information as to the camera and lighting parameters and image size and resolution and where and at what orientations selected identified objects are to be placed and oriented in the selected scene;

responsively to received information and further information,
25rendering in the server computer from associated large high-resolution 3D models of each selected object and also of the identified scene, a photorealistic, 3D high-resolution composite image of each selected object located and oriented in the identified scene; and

30 communicating from the sever computer upon the digital communications network to the client computer this photorealistically-rendered 3D high-resolution composite image;

wherein the client computer is provided with a photorealistically-rendered 3D high-resolution composite image
35without necessity of either (i) having the high-resolution models

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from which this high-resolution composite image is rendered, or
(ii) rendering this high-resolution composite image itself.

19. A method performed by (i) a relatively simple client computer
5running relatively simple software (ii) connected upon a digital
communications network to (iii) a relatively powerful graphics
server computer running relatively sophisticated graphics image
rendering software, of deriving at the client computer a high-
resolution photorealistic 3D image as is a typical product of the
10graphics server computer and beyond the capabilities of the client
computer and software operating therein, the method by which a
networked client computer may bootstrap itself to production of a
high resolution photorealistic 3D image comprising:

receiving in the client computer from the graphics server
15computer across the digital communications network a catalog of,
or tool for generating low-resolution 3D graphics models for
selected (1) objects and (2) scenes in which the objects may
exist;

selecting at the client computer objects and at least one
20scene from the catalog and downloading the selected objects and/or
scene from the graphics server computer across the communications
network, or, alternatively as the case may be, generating with the
tool object and/or scene models;

manipulating at the client computer the received and/or
25generated low-resolution models to derive spatial positions and
orientations of objects within a scene;

communicating these object positional placements and
orientations, and also camera, lighting and image size and
resolution parameters, across the communications network to the
30graphics server computer;

receiving back from the graphics server computer upon the
digital communications network a photorealistic 3D high-resolution
composite image of the objects placed, oriented, illuminated and
viewed from a perspective, as were all derived from the
35manipulating, and as were communicated to the graphics server

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computer;

displaying at the client computer this photorealistically-rendered 3D high-resolution composite image.